

Patent claims

1. An acoustic apparatus for producing audio signals, in which the sound transducer and the at least one sound emergence location are physically separate from one another,  
the sound transducer is connected to the sound emergence location by means of at least one air-guiding sound line, and in which the at least one sound emergence location is provided with a means for achieving acoustic impedance matching for the air in the sound line and the ambient air in order to reduce resonance effects,  
and the means for acoustic resonance matching is made of a material which has the acoustic impedance of air, characterized  
and where this material is placed in two dimensions and conclusively over the at least one sound emergence location.
2. The acoustic apparatus as claimed in claim 1, characterized  
in that the material which has the acoustic impedance of air is a fibrous and/or porous material, particularly felt, sponge material, unwoven fabric or felt metal.
3. The acoustic apparatus as claimed in one of the preceding claims, characterized  
in that the apparatus has at least two sound lines, where the sound emerging jointly from the sound lines has a high sound level through superimposition in a preferred direction and has a lower sound level in an unwanted direction as a result of the design of the sound line and/or as a result of the manner in which the sound is supplied by the sound transducer.

4. The acoustic apparatus as claimed in claim 3,  
characterized  
in that the sound emergence locations of the individual  
sound lines are arranged relative to one another such  
that a flat radiating element is produced.
5. The acoustic apparatus as claimed in claim 5,  
characterized  
in that the flat radiating element comprises individual  
conventional loudspeakers in addition to the sound  
emergence locations of the individual sound lines.
6. The acoustic apparatus as claimed in claim 5,  
characterized  
in that the conventional loudspeakers used are small  
tweeters, which are suitable for radiating the high  
frequencies within the audible frequency range.
7. The acoustic apparatus as claimed in one of the preceding  
claims,  
characterized  
in that to produce acoustic directivity the sound  
emergence locations are firstly arranged like a flat  
panel loudspeaker, but secondly directivity is also  
obtained through antiphase cancellation.
8. The acoustic apparatus as claimed in one of the preceding  
claims,  
characterized  
in that the sound transducer used is an isobaric  
push/pull system.
9. The acoustic apparatus as claimed in one of the preceding  
claims,  
characterized  
in that the sound emergence locations are placed in the

headrests of a vehicle seat,  
and the sound transducers are located outside of the  
headrests.

10. The acoustic apparatus as claimed in claim 9,  
characterized  
in that the support rods of the headrests are used for  
acoustic sound transmission.